

(a) M 1 (b) 1 2



FIGURES 1A, 1B

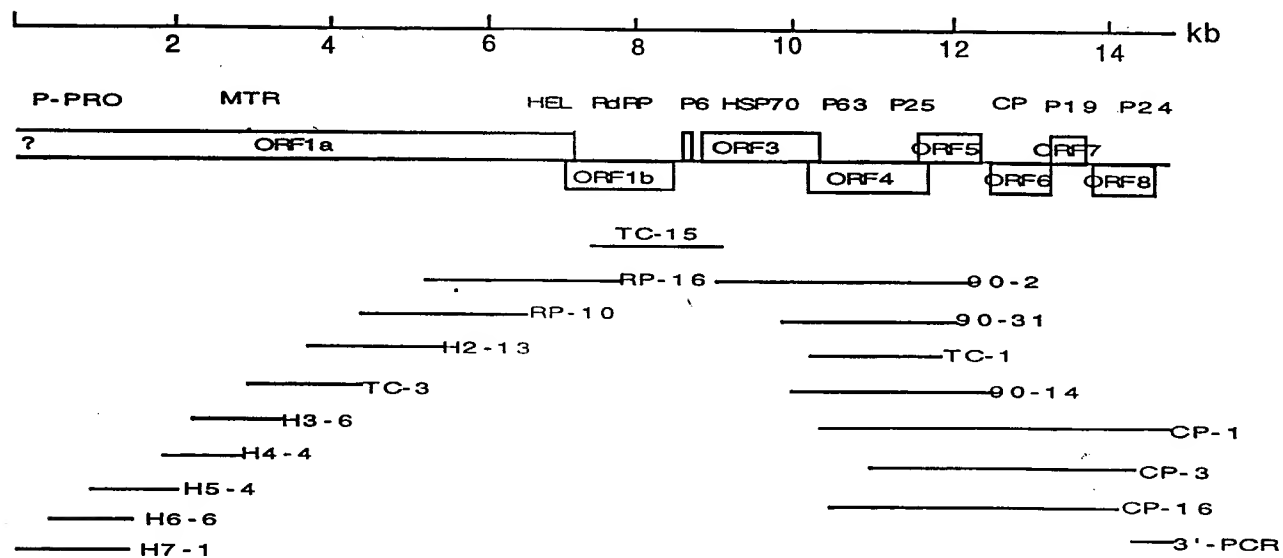


FIGURE 2

a

GLRaV2-PRO ₁	SRVIYPDGRCYLAHMYLCAFYCRPFRESDYALGMWPTVARLRACVEKNFGVEACGIALRGYITSRNHYHCDYDSAYVKYFRNLSGRIG/G
GLRaV2-PRO ₂	TRIRYPNGFCYLAHCRYACAFLLRGFDPKRFDIGAFPTAAKLNRNMVSELGERSLGLNLYGAYTSRGVHFHCDYDAKFIDKDLRLMSAVIA/G
BYV-P-PRO	LQYRPGEGLCYLAHAALCCALQKRTFREEDFFVGMYPYTFVFAKRLTEKLGPSALKHPVRGRQVSRSLFHCDVASAFSSPFYSLPRFIG/G
ConsensusG.CYLAH....CA...R.F.....G..PT.....G.....G...SR...HCD.....I./G

b

		<u>MT I</u>	<u>MT Ia</u>	<u>MT II</u>
GLRaV2-MTR	MSEATQNSLTRFYYPQFELKFSHSSSDHPAAAAASRLLENETLVRLCGNSVSDIGGCPLFHLHSTQRRVHVCRPVLGDGKAQRRVVRDLQ			
BYV-MTR	MGEAVQSGLTRAYPQFNLSFTHSVYSDHPAAAGSRLLENETLASMAKSSFSDIGGCPLPHIK-RGSTDYHVCRPIYDMKDAQRRVSRELQ			
		<u>MT IIa</u>	<u>MT III</u>	
GLRaV2-MTR	YSNVR LG-DDDKILEGPRNIDICHYPLGACDHESAMMMVQVYDASLYEICGAMIKKSRITYLTMVTPGEFLDGRECVYMESLDCEIEV			
BYV-MTR	ARGLVENLSREQLVEAQRVSVCPTLGNVCNVKSDVLIMVQVYDASLNEIASAMVLKESKVAYLTMVTPGELLDEREAFADALGCDVVV			
		<u>MT IV</u>		
GLRaV2-MTR	DVHADVMYKFGSSCYSHKLSIIKDIMITPYLTGGLFVSVMYEVVRMGVNYFKITKSEVSPSISCTKLLRYRRANSDDVVKVLPFRD			
BYV-MTR	DTRRDMVQYKFGSSCYCHKLSNIKSIMLTPAFTFSGNLFSVMYENRMGVNYKITRSAYSPEIRGVKTLRYRRACTEVVQVLPFRD			

c

		<u>HEL I</u>	<u>HEL Ia</u>
GLRaV2-Hel	FVFTNSSVDILLYEAPPGGGKTTTLIDSFLKVFKKGEVSTMLTANKSSQVEILKKVEKEVSNIECQKRKDKRSPKKSITYTIDAYLMHHR		
BYV-Hel	FTFTNLNSANVLLYEAPPGGGKTTTLIKVFCETFSK--VNSLILTANKSSREEILAKVNRIVLD-EGDTPLOTRDR---ILTIDSYLMNRR		
		<u>HEL II</u>	<u>HEL III</u>
GLRaV2-Hel	GCDADVLFIDEC FMVHAGSVLACIEFTRCHKVMIFGDSRQIHYIERNELDKCLYGDLDLDRFVLDQCRVYGNISYRCPWDVCAWLSTVYGNL		
BYV-Hel	GLTCKVLYLDEC FMVHAGAAVACIEFTKCD SAILFGDSRQIRYGRCELD TAVLSDLNRFVDDESRVYGEVSYRCPWDVCAWLSTFYPKT		
		<u>HEL V</u>	
GLRaV2-Hel	IATVKGESSEKSSMRINEINSVDDLVPDVGSTFLCMLQSEKLEISKHF---IRKGLTKLNVLTVHEAQGETYARVNLVRLKQFQEDDEPFKS		
BYV-Hel	VATTNLVSAGQSSMQVREIESVDDVEYSSEFVYLTMLQSEKDLLKSFGKRSRSSVEKPTVLTVHEAQGETYRKVNLVRLTKFQEDDPPFRS		
		<u>HEL VI</u>	
GLRaV2-Hel	IRHITVALSRHTDSLTYNVLAARRGDATCDIAIQKAAELVNKFRVFPPTSFGGS		
BYV-Hel	ENHITVALSRHVESLTYSVLSSKRDDAIAQAIKAKQLVDAYRVYPTSFSGGS		

d

		<u>RdRP I</u>	<u>RdRP II</u>	<u>RdRP III</u>
GLRaV2-RdRP	ICRFKLMVKRDAKVKLDSSCLTKHSAAQNIMFHRKSINAIFSPIFNEVKNRIMCCLKPNIKFFTEMTNRDFASVVSNNLGDDDVYHIGEV			
BYV-RdRP	ITTFKLMVKRDAKVKLDSSCLVKHPPAQNIMFHRKAVNAIFSPCFDEFKNRIVITCTNSNIVFFTEMTNSTLASIAKEMLGSEHVYNVGEI			
		<u>RdRP IV</u>	<u>RdRP V</u>	
GLRaV2-RdRP	DFSKYDKSQDAFVKAFEEVYKELGVDEELLA IWMCGERLSIANTLDGQLSFTIENQRKSGASNTWIGNSLVTLGILSLYYDVRNFEALY			
BYV-RdRP	DFSKFDKSQDAFIKSFERTLYSAFGFDELLDVWMQGEYTSNATLDGQLSFSVDNQRKSGASNTWIGNSIETLGILSMFYITNRFKALF			
		<u>RdRP VI</u>	<u>RdRP VII</u>	<u>RdRP VIII</u>
GLRaV2-RdRP	ISGDDSLIFSRSEISNYADDICTDMGFETKFMSPSPYFCSKFVVMCGHKTFFVDPYKLVKLGAVKEDVSMDFLFETFTSFKDLTSDF			
BYV-RdRP	VSGDDSLIFSESPIRNSADAMCTELGFETKFLTPSPYFCSKFFVMTGHDFVFPDPYKLLVKLGASKDEVDDEFLFEVFTSFRLTKDL			
GLRaV2-RdRP	NDERLIQKLAELVALKYEVQGTNTLAL			
BYV-RdRP	VDERVIELLTHLVHSHKYGYESGDTYAAL			

FIGURES 3A, 3B, 3C, 3D

a

GLRaV-2	CAUGAUAAGCAGCGUGUU <u>UAGCG</u> UAGUUGGUCGAGGCGAUUCCGCGUAGA
BYV	CACGACCGCGAGCGGGUU <u>UAGCT</u> CGAUUUGCUUGCAGGCGAUUCCUAAGAGG
BYSV	CACGAUGAACAGCGCGUU <u>UAGCG</u> UAGUAGGUUGCAGGCGAUUCCUAAAAGG
CTV	CACGAACCGCGUUGCGUU <u>UAGCG</u> UAGUAGGUCACAAGCAAUCCUCCAAGA
Consensus	CA.GA.....CG.GUU..GC....U....UC.CA.GC.AU.CC....AG.

b

GLRaV-2	H	D	K	Q	R	V	<u>S</u>	V	V	R	S	Q	A	I	P	R	R
BYV	H	D	P	Q	R	V	<u>S</u>	S	I	R	S	Q	A	I	P	K	R
BYSV	H	D	E	Q	R	V	<u>S</u>	V	V	R	S	Q	A	I	P	K	R
CTV	H	E	P	A	R	V	<u>G</u>	V	V	R	S	Q	A	I	P	P	R
Consensus	H	.	.	.	R	V	.	.	.	R	S	Q	A	I	P	.	R

FIGURES 4A, 4B

GLRaV2-HSP70 A
 BYV-HSP70 MVVFGLDGTTFTSTVCVYKGRVFSFKQNN SAYIPTYLFLSDSNHMTFGYEAESLMSNLKVKG SFYRDLKRWGCDSSNLDAVLDRLKP
 MVVFGLDGTTFTSSVCAYVGEELYLFKQDSAYIPTVFLHSDTQEVAFGYDAEVLSDLSVRGGFYRDLKRWIGCDEENYRDYLEKLP

GLRaV2-HSP70 B
 BYV-HSP70 HYSVRLVKIGSGLNETV SIGNFGGTVKSEHL PGLIALFIKAVISCAEGAFACITGVICSV PANYSVQRNFTDQCVSLSGYQCVYMIN
 HYKTELLKVAQSSKSTVKLDCYSGIVPQNATL PGLIATFVKALISTASEAFKOQCTGVICSV PANYNCLQRSFTESC VNLSGYPCVYMN

GLRaV2-HSP70 C D
 BYV-HSP70 EPSAAALSACNSIGKKSANLAVYDFGGGTFDVSTLSYRNNTFVVRASGGDLNLGGRD VDRAFLTHLFSLTSL EPDLITLDSLNLKESLSKT
 EPSAAALSACSRIKGATSPVLVYDFGGGTFDVSVLSALNNTFVVRASGGDMNLGGRDIDKAFVEHLYNKAQLFVNKYKIDISFLKESLSKK

GLRaV2-HSP70 E
 BYV-HSP70 DAETVYTLRGVDGRKEDVRVNKNILTSVMLPYVNRILKILESTILKSYAKSMNESARVKCDLV LIGSSYLPGLADVLTKHQSVDRILRVS
 VSFLNFPVWSEQVRVDVLMNVSELA EVAAPFVERTIKIVKEVYEKYCSSMRLEPNV KAKLLMVGGSSYLPGLLSRLSSIPFVDECLVLP

GLRaV2-HSP70 F G
 BYV-HSP70 DPRAAVAVGCALYSSCLSGSGLLLIDCAHTVAIADR SCHQLICAPAGAPIPFSGSMPLYLARVNKNSQREVAVFEGEYVKCPKNRKIC
 DARA AVAGGCALYSACL RNDSPMLLVDCAAHNL SISKYCESIVCPAGSPIPTGVRTVNM TGSNASAVYSAALFEGDFVKCRINRIF

GLRaV2-HSP70 H
 BYV-HSP70 GANIRFFDIGVTGDSYAPVTFYMDFSISSVGAVSFVVRGPEGKQVSLTGTPAYNFSSVALGSR SVRELHISLNKVF LGLLHRKADRRI
 FGDVVLGNVGVITGSATRVPLTLEINVSSVGTISFSLVGPTGVKKLIGGNAAYDFSSYQLGERVWADLHKHNSDKVLIHALTYQPFQK

GLRaV2-HSP70
 BYV-HSP70 LFTKDEAIRYADSI--DIADVLKEYKSYAASALPPDEVELLLGKSVQKVLGRSRLEETPL.
 KLITDGKALFLKRLTADYRREARKFSSYDDAVL---NSSELLGRIIPKILGRSRVEKLD-V

FIGURE 5

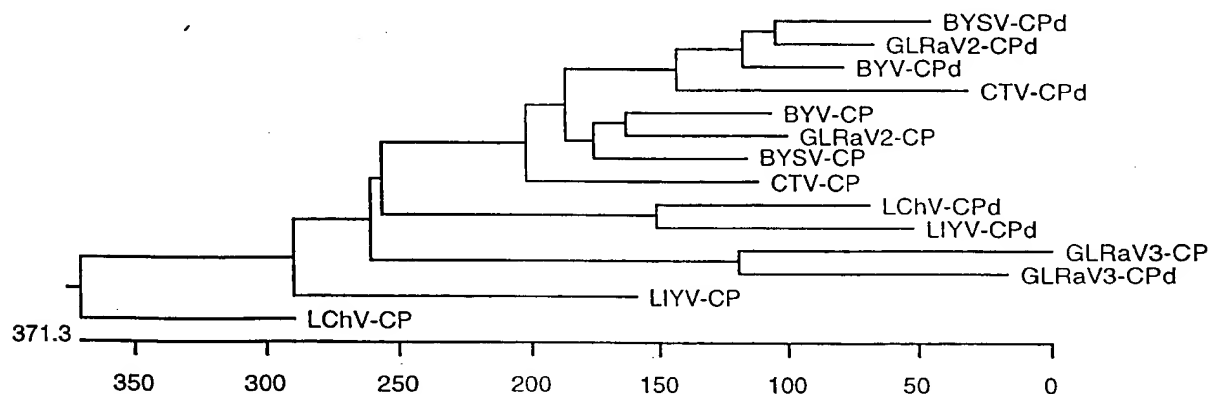
a

GLRaV2-CP	M-----ELMSDSN-----L-----SNLVITD-----ASSINGVDKLLSAEVEKMLVQK--GAPNE
GLRaV2-CPd	M-SSNTSVPVGLEALETSGVVLITR-KEAVDKF-----FNEIKENYSSVDSSRLSDSEVKEVLEKSSESFK--SELASTDE
BYV-CP	MGSAEP-----ISA-----IATFENVSLAD-----QTCLHGECDCIKLRKNFEELK--GVPED
BYV-CPd	MLAPEARGDLTH-----FTENIRDAMEIF-----FNSYDLAEYSEVNPKNLRKETDELLGVIRERFK--SELVITDE
BYSV-CP	MAGND-----EGSDSSASQIMTAKD-----MIFAPPENFARAS-----ATCLNGENKKKLFEEFSVRVKIQ--DVIES
BYSV-CPd	M-PPQGAELVEHNANKSSLEVFSSEIREKVGKF-----FNNFDHKTQVNPNNLLNEDELREVLGKLTTELK--TNLKALDE
CTV-CP	MDEETKKLKNKKEIKEGDDVAAESSFSSVN-----LHIDP-TLITMND-----VRQLSTQQAALNRDLFLITLKGKHENLPDK
CTV-CPd	M-AGYTVLPKTDKEMDPVSAAPGKYPDVLEKFNANRSDALIEGVISKLDINSTIYEDSTEKFTGEHLKYVMVIMDTFLL--ENYKIKTE
Consensus	M.....

GLRaV2-CP	GI EWFGLLYALAAITTSKVRADSDVIFSNSFGE-RNWWTEGDIKKVLDGCAPLIRFTNKLRIEGRIFT EAYVDFC IAYKHLEQL
GLRaV2-CPd	HFVYHI IFFLIRCAKISTSEKVKY--VGSH--TYWDGKTYIVLDWVENMMSLTKK YKRVNGLRAFC CACEILYLI VA PIMS ERFKT-
BYV-CP	NLGIALGLCLYSCATIGTSNKVMQPISTFIKASFGGKELYLTGHEINSFLGSQKLLHCKPNKLRFCFRIFQKDYISLRKEYRGKLPPI
BYV-CPd	IFVKHLAFALIRANITTSVKVNY--VGAY--EYTI GKKFLVKDAWVFP LIKE CMKKFNKPNVRIFCATFEDAYIVTARS LPKLFIN-
BYSV-CP	GIPTILGMILYALAILSTSSKIDIEDKTPVLSAKIDAWN-VITIYEDIKNFVNSLITLLKNYKNKLRVFARIFE EYLR FVRQYKHILENI
BYSV-CPd	DIYHVAFFLIRASVWSTSPKVEY--KGSY--SYSIDQRKYIVNDWIFPQVKI LASKHNKPNGLRAFCASLEGMYLSVARLGPDAGT-
CTV-CP	IKDFRIAMLYRLAVKSSSLQSDDATGITYTR--EGVEVLDLSDKLWIDVVENSKGI GNR TNALRWGRINDALYLAFCRQNRN-LSYG
CTV-CPd	ILLVHLTMIQKRLYTISTSIKTKFRDKGCI--SYVQGLRYKLLDKVVFPIISKFIDRET PNA LRKFA CIFEELHLOMARLPDLYEN-
ConsensusS.....N..R.....

GLRaV2-CP	NAAELGIPAE DSYLAADFL-GT'CPKLS ELQQSRKMFASMYALKIEGGVNTTP-VSNLRQLGRR-EVM
GLRaV2-CPd	KAVGMKGLPVGKEYLGA DFLSGT SKLMSIDHRAVSTVAAKNAVDRSAFTGGERKIVSLYDLGR--Y
BYV-CP	ARANRHGLPAEDHYLAADFT-STSTELTDLQSR-LLARENAITHEFSSSE P-VTSLKQLGRGLGTGR
BYV-CPd	RTI GKRGI PSGYEFLGADFLITATSVCLNDHEKAIVLQASRAAIDRAVSSSDGKIVSLFDLGR--S
BYSV-CP	ARANKHGIPADYSYLAADFV-QT SNLLKEHQAV-LL EGRNAATASSGTIRES-AVNLKYL G---GSSK
BYSV-CPd	RSVGRGAPSGSEYLGADFLITSTCPLMSIDHRAVALSASRNALIRSAASQIDKRMVSLYDFGKVVYT
CTV-CP	GRPIDAGIPAGHYLCADFL--TGAGLTDL-CAVYIQAKEQLLKKRGADDVV-VINVRQLGKF--NTR
CTV-CPd	KRTTRAGTPHLKGYSADFLSGSLPGYSEHERGIILRASESMLARRQGYEEATELINLRDLGK--YL
ConsensusG.P.....L.ADF.....G.....

b



FIGURES 6A, 6B

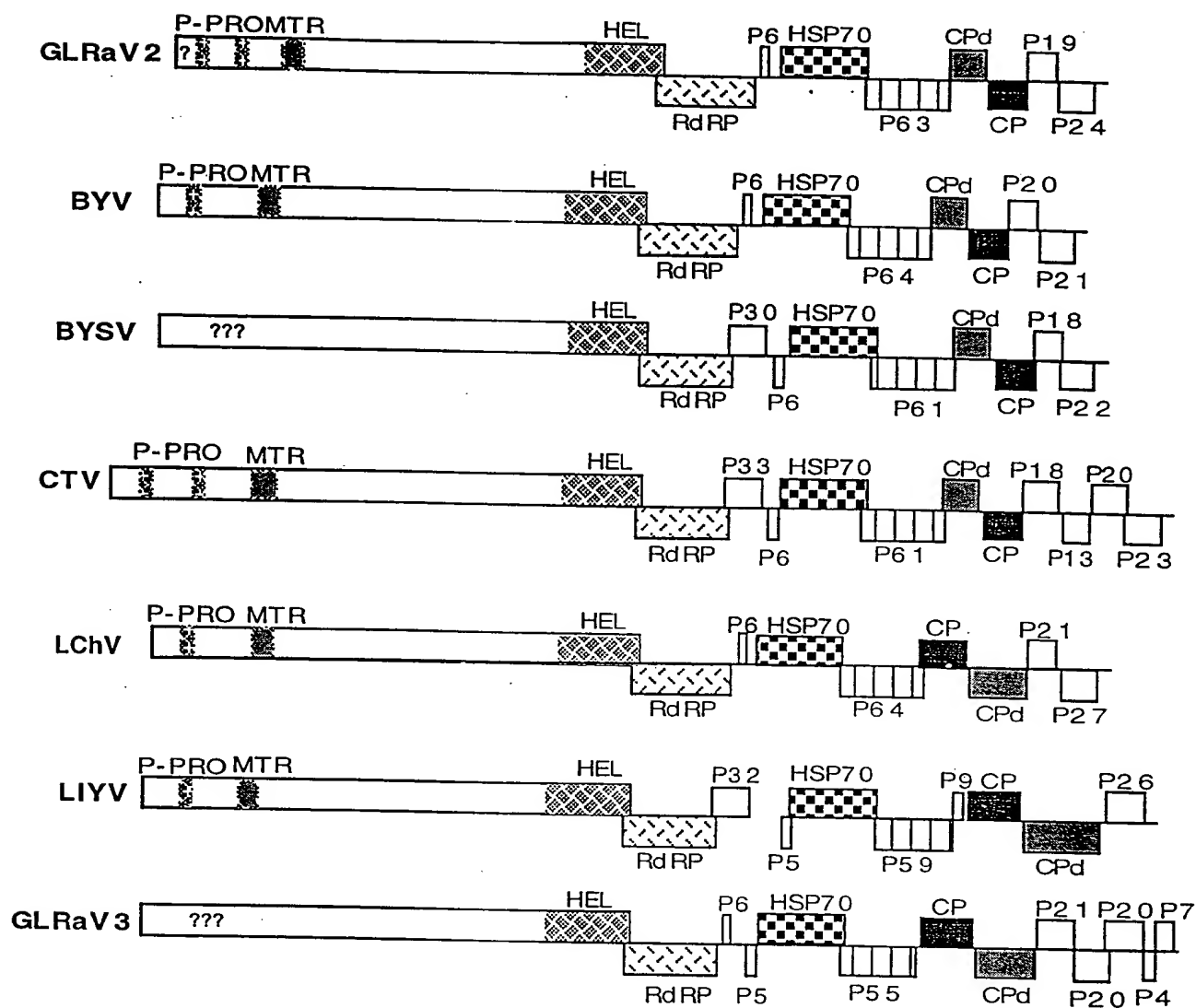


FIGURE 7

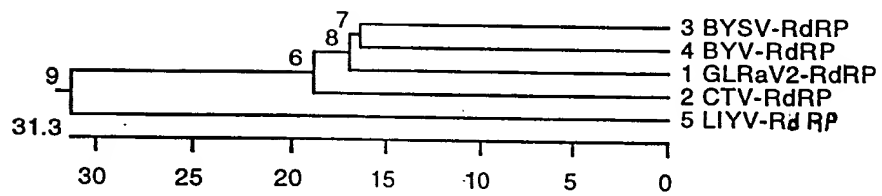


FIGURE 8

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GLRaV2-HSp90 MS-----NYSWESLFKKFYGEADWKKYLSRSIAAHSSEIKTLPDIRLYGGRVVKSEFESALP
 BYV-HSP90 MTTRFSTPANYYWGELFRFFGGQEWKNLMSEAAVSRRPYSS--DFRFSBGVILSRKTFGESTG
 BYSV-HSP90 MSRR-PTFAGYSWGSFLFKRHYGEPEWKSYLETSMKYKPLKSE--SITFYDGSSLTSAELRPARS
 CTV-HSP90 MSSH-----HVGWGLFRKFYGEAIWKEYLSESTRNFDERNVSL-DHTLSSGVVVRQSLNAPQ
 Consensus M.....W..LF....G...WK.....G.....

GLRaV2-HSp90 NSFEQE--LGLFILSEREVGWS-KLCGITVEEAAYDLTNPKAYKFTAETCSPDVKGEQKYSMED
 BYV-HSP90 ESFVREFSL-LLTFPKTYE--VCKLCGVAMELALNGMNLSDYN-VSEFNIVDVKTGCKFNIQS
 BYSV-HSP90 GT--AEYEIALLIFFSDSITKWSEKL-ERSIYRGLNQHNNHSIYA-ETELEVTDVKTIGCKFTISA
 CTV-HSP90 GTFENE--LALLYNSVVINDFVE-LTGMPLKSLMTGIEDRKV---PDELISVDPHEVGCRFTLND
 ConsensusE....L.....L.....E....D....G.....

GLRaV2-HSp90 VMNFMRLSNLDVNDKMLTEQCWSLSNSCGELINPDDKGRFVALTFKDRDTADDTGAANVECRVGD
 BYV-HSP90 VTEFVKKINGNVAEPLSVEHCWSLSNSCGELINPKDKTRFVSLIFKGDLAESTDEAIVSSSYLD
 BYSV-HSP90 VESFM----GGRASAAQVEHCWSLSNSCGELINPNDTARFIQLVFKDKAVTEQAQ-VNTSGSVSD
 CTV-HSP90 VESYLMSRGEDFADLAAVEHSWCLSNNSCGRLSSTEIDAYKTLVFT-KNF--DSNVSGVTTKLET
 Consensus V.....E...W..LSNSCG..L.....L.F.....

GLRaV2-HSp90 YLVYAMSLFEQRTQKSQSGNISLYEKYCEYIRTYLGSTDLFFTPADRIPLLTGILYDFCKEYNVF
 BYV-HSP90 YLSHCLNLYETCNLSSNSGKSLYDEFLKHVIDYLENSDLEYRSPSDNPLVAGILYDMCFEYNTL
 BYSV-HSP90 YLVYCLQLYDNSKKKSNAAGRTQLMESYVSFIRDFQHSYRSPDLNPLLTGVLIDLCIEHNVL
 CTV-HSP90 YLSYCLISLYKKHCKMKDD-DYFNLILPMFNCMLKVLASLGLFYEKHADNPLLTGMLIEFCLENKVY
 Consensus YL.....L.....L.....L.....PL..G.L...

GLRaV2-HSp90 YSSYKRNVDNFRFFFLANYMPLISDVVFQWVKPAPDV---RLLFELSAAELTLEVPTLSLIDSQ
 BYV-HSP90 KSTYLKNIESFDCFLSLYLPLLEVFVSMNWERPAPDV---RLLFELDAAELLLKVPTINMHDST
 BYSV-HSP90 RGSYLKNLDNFRFLFKQTYLPMIDIFDYSWELYPDE---RLLFPIDPYEIIKEVPTMSVIDAN
 CTV-HSP90 YSTFKVNLNDNRLFKSKVLPVVLTV---WDISEPDDPMDERVLIPFDPTDFVLDLPLKNIHDTM
 ConsensusN.....F.....P.....W....PD....R.L.....P....D..

GLRaV2-HSp90 VVVGHILRYVESYTSDDPAIDALEDKLEAILKSSNPRLSTAQLWVGFFCYGFEFRTAQSRVVQRPG
 BYV-HSP90 FLYKNKLRYLESYFEDDSNELIKVKVDSLTLTRDNPELKLAQRWVGFFCYGFEFRTAQSRVVKRDA
 BYSV-HSP90 VVLSNKLVLDSYLENNSILALEKKIISILCRDNEGIDEGALWAAFFCYGTYRTARQVRVVKRPD
 CTV-HSP90 VVVGNIQIRQLEYVVEDSALDDLQSHVDLRLAADNPDLRVGLRWAGMFVYGVYRCVVDRAVERPT
 ConsensusL...N.....W....YYG..R....R.V.R..

GLRaV2-HSp90 VYKTPDSV-----GGFEINMKDVEKFFDKLQRELPNVSLRRQFNGARAHEAFKIFKNGNISFRP
 BYV-HSP90 EYKLPPAL-----GEFVINMSGVEEFFEELQKKMPSISVRRRFCCGSLSHEAFSVFKRFGVGFPP
 BYSV-HSP90 TYELDGIF-----SKPIV-MSGVELFFDELQKRVPDVSLRRRFNGAKAGEAITVFKKLGISFPP
 CTV-HSP90 LFRLPQKLLSQDDGESCSLHMGSVEALFNLVQKVNKDINVRQFMGRHSEVALRLYRNLGLRFPP
 ConsensusM..VE..F...Q.....RR.F.G....A.....F.P

GLRaV2-HSp90 ISRLNVPREFWYLNIDYFRHANRSGLTEEEILILNNISVDVRKLCAERACN-----TLPSAKR
 BYV-HSP90 ITRLNVPVKYSYLNVDYRHRVKGVLQDELTLISNIEFDVAEMCCEREVALQAR--RAQRGEKP
 BYSV-HSP90 ITRLNAPSKYSYLNIDYFKQANSGLTEPEKIIILCNIAKDVMCAQRISSVKA-----KP
 CTV-HSP90 ISSVRLPAHHGYLYVDYFYKRPDGAVTADELESRLQRSSVDVMCKDRVSITPPFNRRLRGSSR
 Consensus I.....P....YL..D.....T..E...L.....V...C..R.....

GLRaV2-HSp90 FSKNHKSNIQSSRQERRIKDPLVVLKDTLYEFQHKRAGWGSRSTRDLGSRADHAKGSG.
 BYV-HSP90 FQGWKGTKNEISPHARSSIRVKKNDSLLNLWKDVGARSQRRNLPLHRK-----H
 BYSV-HSP90 IAQRNG--EAINSAKIRTLPTNTLVRALEKCLLNQAPSWWNTTLNLNR
 CTV-HSP90 TFRGRGARGASSRHSRSDVATSGFNLPHYGRLY-----STS
 Consensus

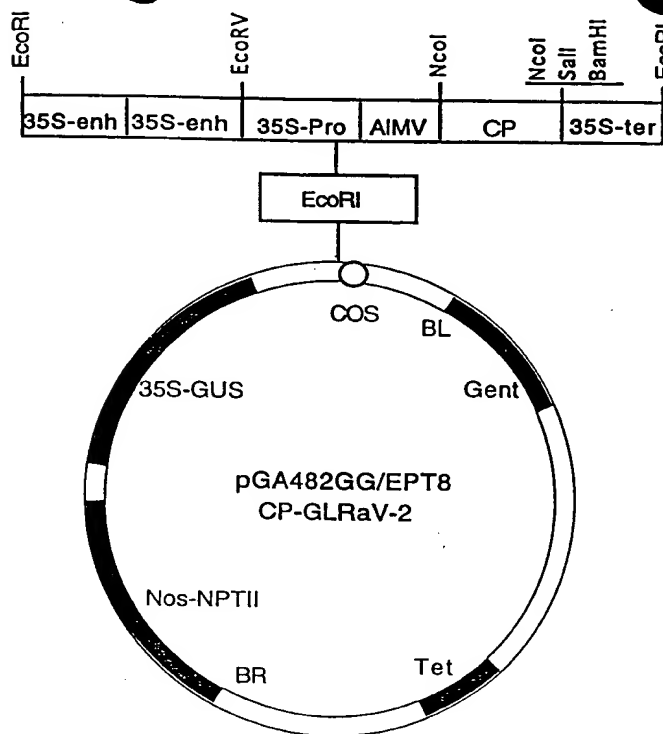
FIGURE 9

GLRaV2 3'-UTR	TTAAGCTGTTACTGAGTAATTAAACCAACAAGTGTGGTGTAAATGTGTATGTTGATGTAGA	135
BYS 3'-UTR	TTAAGTCGTCACAGAGTGACAACGGCACCAAGTGGTGTAGTGCGTATGTAAATTACGAA	95
BYSV 3'-UTR	TTAAGCCCTCACAGAGCGAGAACGTTGGCAAGAGCCAATTAGTGTGTGTGTAGTATAATTA	181
CTV 3'-UTR	CTAAGCTCCACAGAGTGGTAGTGGTCTCAAGTGAGGCTTAACGTATGCGTGAACCAAAGA	208
Consensus	.TAAG.....AC.GAG.....CAAG.G....T.....A	

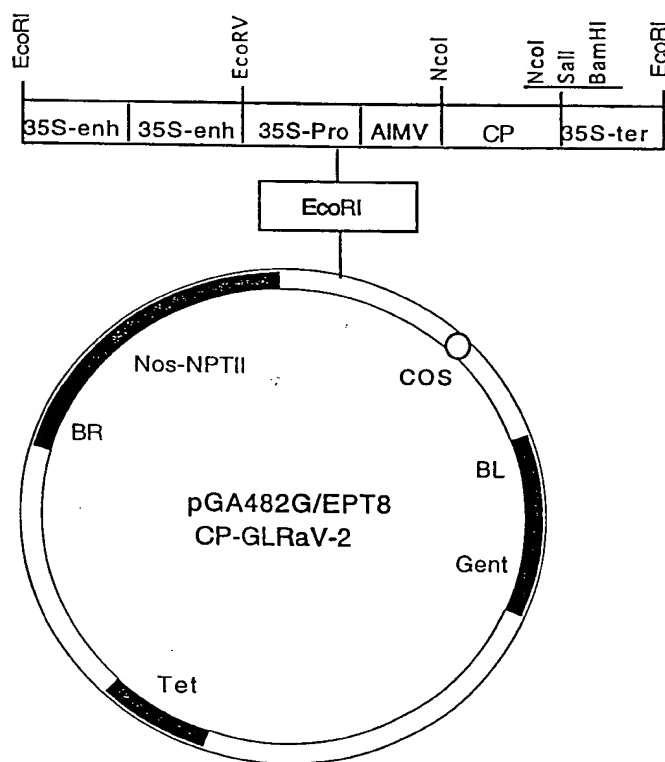
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FIGURE 10

A



B



FIGURES 11A, 11B

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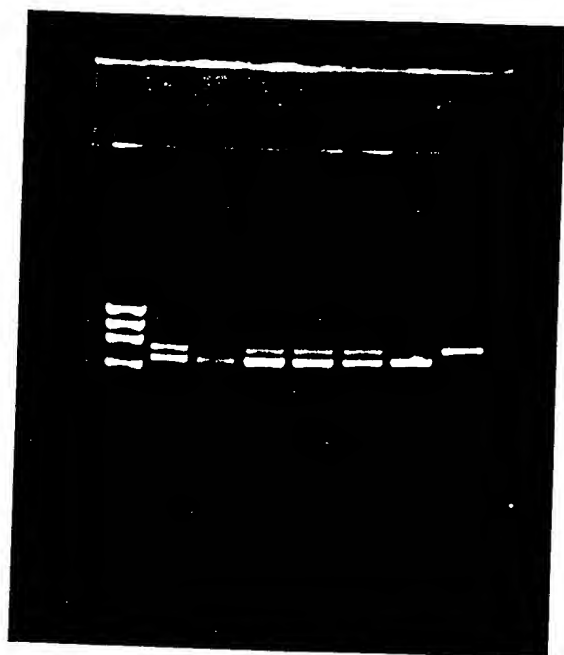


FIGURE 12

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FIGURE 13

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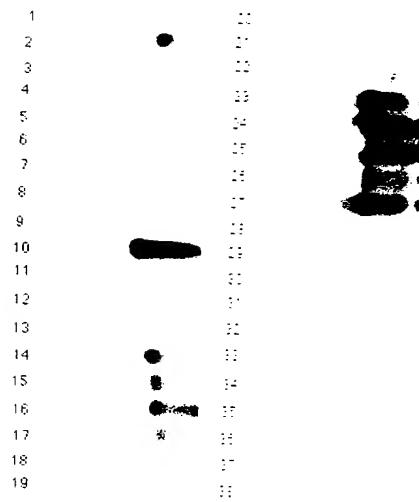


FIGURE 14